

GEC09-2009-020075

Abstract for an Invited Paper  
for the GEC09 Meeting of  
the American Physical Society

### **Data needs for plasma modeling**

LAXMINARAYAN RAJA, The University of Texas at Austin

Plasma discharge phenomena are governed by a complex interplay between electromagnetic field phenomena, gas-phase non-equilibrium chemistry, gas-phase species transport, and interactions of the gas species with surfaces including surface chemistry. A wide hierarchy of models is used to represent discharge phenomena. These models are essentially approximations to the Maxwell's equations coupled to the species Boltzmann equation or moments of the Boltzmann equation, with additional model representations for surface interactions. This talk will highlight the data needs to complete the model description of the plasma. Data requirements for species collision cross sections, species transport properties, reactive gas-phase chemistry, surface phenomena including secondary electron emission and surface chemistry will be discussed. Sources of this data ranging from experimental measurements to *ab initio* calculations will be described. Finally, dependence of solution accuracy of the plasma models on the uncertainty in the input data will be illustrated through examples.